

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
25 August 2005 (25.08.2005)

PCT

(10) International Publication Number  
**WO 2005/078843 A1**

(51) International Patent Classification<sup>7</sup>: **H01M 8/04, 8/12**  
(21) International Application Number:  
**PCT/GB2005/000355**

(22) International Filing Date: 2 February 2005 (02.02.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
0402906.2 10 February 2004 (10.02.2004) GB

(71) Applicant (for all designated States except US): **CERES POWER LIMITED** [GB/GB]; Unit 18, Denvale Trade Park, Haslett Avenue East, Crawley RH10 1SS (GB).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **LEAH, Robert** [GB/GB]; Flat 2, 10 Ledbury Place, Croydon, Surrey CR0 1BT (GB). **BRANDON, Nigel, Peter** [GB/GB]; 60 York Road, Sutton, Surrey SM2 6HD (GB). **DUCKETT, Athol** [GB/GB]; 2 Providence Place, Epsom, Surrey KT17 4BB (GB). **EL-KOURY, Karim** [GB/GB]; 4 Egerton House, 59 Belgrave Road, London SW1V 2BE (GB). **SCHMIDT, Martin** [GB/GB]; 31 Lodge Road, Wallington SM6 0TZ (GB).

(74) Agents: **ILLINGWORTH-LAW, William et al.**; D Young & Co, 120 Holborn, London EC1N 2DY (GB).

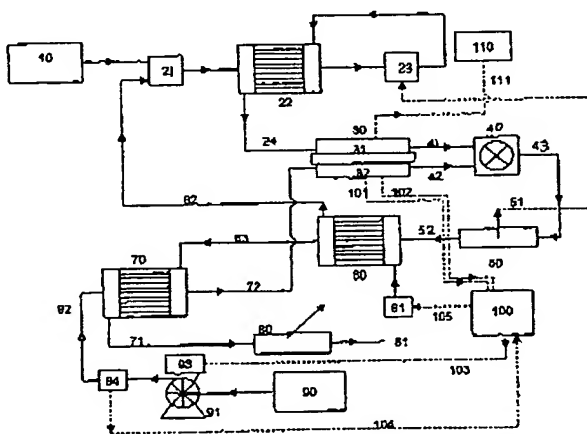
(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:  
— with international search report

[Continued on next page]

(54) Title: A METHOD AND APPARATUS FOR OPERATING A SOLID-OXIDE FUEL CELL STACK WITH A MIXED IONIC/ELECTRONIC CONDUCTING ELECTROLYTE



SOFC system operating on LPG showing method of implementation described in Method 1

(57) Abstract: A method and apparatus for operating an intermediate-temperature solid-oxide fuel cell stack (10) with a mixed ionic/electronic conducting electrolyte in order to increase its efficiency. The required power output of the solid-oxide fuel cell stack (10) is determined and one or more operating conditions of the solid fuel cell stack (10) are controlled dependent upon the determined required power output. The operating conditions that are controlled may be at least one or the temperature of the fuel cell stack and the dilution of fuel delivered to the fuel cell stack.

WO 2005/078843 A1

**WO 2005/078843 A1**



---

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*